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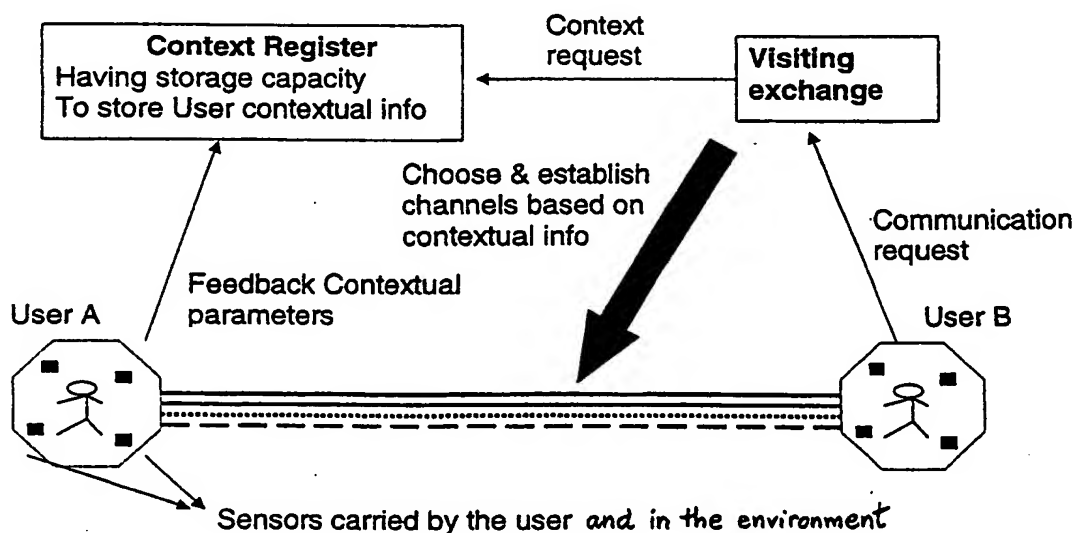
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(71) Applicant (for all designated States except US): TELEFONAKTIEBOLAGET LM ERICSSON [SE/SE]; S-126 25 Stockholm (SE).			
(72) Inventors; and (75) Inventors/Applicants (for US only): DO, Van, Thank [NO/NO]; Stjernemyrveien 28, N-0613 Oslo (NO). HERSTAD, Jo [NO/NO]; Josefines gate 2B, N-0351 Oslo (NO).			
(74) Agent: OSLO PATENTKONTOR AS; P.O. Box 7007 M, N-0306 Oslo (NO).			

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Architecture of Contextual Communications

(57) Abstract

The present invention relates to an arrangement for improving a communication system s as to further improve the support of human - human communication and interaction at a distance, and this improvement is according to the present invention suggested in that the arrangement comprises means for providing information about the context in which a user is situated.

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## PERSONALISED CALL TREATMENT IN A COMMUNICATION SYSTEM

Field of the invention

5 The present invention relates to an arrangement for improving a communication system so as to further improve the support of human - human communication and interaction at a distance.

10 Background of the invention

We already live in a society accustomed to ubiquitous telecommunications. Telephones are in every office, cellular phones are in many cars and in the hands of pedestrians on  
15 the move, and many people are reachable at any time with advanced smart phones, PDAs and pagers. More recently, the Internet has increased our tele-connectivity by allowing us to exchange text, images, sound and video with anyone whose interest we share, professionally or socially.

20

Telecommunication for professional use or social use has mainly been done from the office or from the home. A steadily increasing part of human - human communication is done from other places than the home or office. Personal  
25 mobile communication solutions are often described as providing a transparent "place". Mobility often means not disregarding place, but rather the complex encounter of multifarious new places and faces.

30 During studies conducted with solutions for mobile communication, observations with respect to the context (location, time and user state) in which human-human communication

takes place, have shown the following about the person using the mobile communication solution:

Person cannot see very well (or at all), e.g. work is conducted at night in the basement.

5

- Person cannot hear very well (or at all), e.g. found in noisy factory setting.

10

- Person cannot read very well (or at all), e.g. while driving from one site to another site.

- Person cannot move their heads or arms very well e.g. (or at all), while at the top of a mast.

15

- Person cannot speak very well (or at all), e.g. while required to be silent by co-workers.

- Person cannot feel with their fingers very well (or at all), e.g. while it is cold.

20

- Person cannot remember well (or at all), e.g. while to focused on one site job.

This is not a result of the communication solution or technology per se, but a direct result of varying context that the mobile users are operating in. The mobile communication solution offered today is unaware of the context in which the users are operating in.

25

One of the implications from our case study is that the system itself has to be aware of the context that the person is working in, so as to determine:

- 5 • Type of interaction modality
- Communication mode/media to be used

There are no known such functions supported directly today.

10

However, there are some manual, user-operated functions that may be used to select the type of interaction modality and communication media. These are manually controlled.

The following functions are relevant:

15

- ON/OFF switch for mobile/cellular phone
- ON/OFF switch of loudspeaker/buzzer at phone

- 20 • ON/OFF switch for computer

- ON/OFF switch for loudspeaker/screen at phone

- Diversion/call forward/follow me functionality - manu-  
25 ally controlled

- User profile - manually controlled

- Absence marking

30

Problems relates to existing systems

There is no automatic updated information in the communication system of which context the user is situated in.

5

Information about the context of which a user is situated in may be valuable to the user, so as to determine:

- Interaction modalities (input: haptic, voice. Output: visual on screen, auditory at loudspeaker, buzzer).
- Selection of communication media (audio, video, text/images)

10

State of the art

15

According to our knowledge, there is currently no system supporting communication based on the context of the user, e.g. he is in a dark room and is not able to read and hence textual display is not actual for him; voice communication must be used.

20

EP 0 578 374 A1 relates to a method and apparatus for providing a personal locator, access control and asset tracking service using an in-building telephone network. According to this publication there is suggested the use of ID badges containing an RF transmitter in order to determine the location of a user, access control to the system, as well as access control to the system and asset tracking of equipment or apparatus.

25  
30

This prior art system is built around an in-building telephone network (PABX), and the physical position of the user or the equipment/apparatus is updated by the system.

5 However, this prior art does not give any instructions for providing information about the context of the user, let alone that this context should be used by a communication system to determine the users interaction method with the system (input and output), the selection of communication  
10 medium (text, sound, picture, video, others).

JP 09064945 A relates to a sound volume setting device for portable telephone set, and discloses a solution by which the system automatically sets the sound volume for a port-  
15 able telephone set. Further, this prior art discloses a system which differentiates whether the user is connected the services of the public base station or the home use telephone set.

20 Consequently, this prior art solution suggests a specific mechanism which is used for detecting server connection, and utilises information thereabout for setting the sound volume. The prior art system is based on two discrete values about the location of the user, i.e. a first value re-  
25 lated to the public base station, and a second value related to the home use telephone set, and this information is used by the system for setting said sound volume.

US 5 610 969 relates to a personal communication service  
30 registration system and method, and discloses a system for user registration in this system. This registration is

utilised for routing calls to a user, both in wireless and wired networks.

5 The disclosed prior art solution, as far as it can be understood, makes it possible for the system to call a user with a telephone number (personal telephone number), but does not give any indication about information about the context of any user.

10 WO 98/21911 A1 relates to a devise for routing information updates, and suggests a system for automatic updating of the location of a user in an intelligent network solution. According to this prior art it is only the location, i.e. the physical position, of the user which is updated in the  
15 prior art system. This information is used by the system for routing calls to the communication equipment which is in the vicinity of the user.

This prior art solution is based upon the ideas related to  
20 Universal Personal Telecommunication, UPT, and consequently to the limitations therein which are to the fact that the user must manually give information to the system about his position. However, according to this prior art the telecommunications network automatically registers and de-  
25 registers terminal equipment based on sensed user location. Nevertheless, this prior art gives no instructions for providing information about the context in which a user is situated, i.e. the physical conditions of the location, the time in question, as well as biometrics related thereto.

30

Objects of the invention



An object of the invention is to provide an arrangement for improving a communication system so as to further improve the support of human - human communication at a distance.

- 5 A further object of the present invention is to provide an arrangement wherein this exchange of information can be implemented in an appropriate manner in already existing networks.
- 10 Still another object of the present invention is to provide an arrangement by which the feedback communication link handling such feedback contextual parameters is adapted to not only communicate this information to the services of the communication system about any preferred interaction
- 15 modality, and any preferred communication media, but also to be influenced by direct user control, for further refine selection of said modalities and media.

/ Summary of the invention

20

The above objects are achieved in an arrangement as stated in the preamble, which according to the present invention is characterised in that the arrangement comprises means for providing the communication system with information

25 about the context in which a user is situated.

The following main parameters may be used to describe the context:

- Physical position
- 30 • Environmental conditions
- Time

- User state

The following parameters determining the context are for example as follows:

5

- Physical location (co-ordinates, longitude, latitude, altitude, etc.)
- Physical movement (speed, direction of movement, etc.)
- Weather conditions (temperature, humidity, rain/snow, etc.)

10

- Light condition (dim, sunny, etc.)
- Audio condition (silent, noisy, etc.)
- Time of day (local time, day, evening, night, etc.)
- Task at hand (attention span, etc.)

15

- Mood (asleep, awake, busy, free, etc.)

Further features and advantages of the present invention will appear from the following description taken in connection with the enclosed drawings, as well as from the enclosed patent claims.

20

#### Brief disclosure of the drawings

Fig. 1 is a schematical diagram illustrating the main features involved in an arrangement comprising contextual communication according to the present invention.

25

Fig. 2 is a schematical diagram illustrating an embodiment of the arrangement according to the present invention, es-

pecially the architecture of the contextual communication suggested by the present invention.

#### Description of embodiments

5

A simple description of the framework for contextual communication is depicted in Figure 1.

The architecture of Contextual Communications is illustrated in Figure 2. User A and User B both carry sensors permitting to collect contextual parameters. These parameters are sent to the Context Register (CR). The CR is an extension of the existing GSM LR (Location Register) in the sense that it contains in addition to location parameters, other contextual parameters. When User B wants to communicate with User A and addresses to the Local Exchange, the latter one will communicate with the CR asking for the Contextual Information of User A. Based on the contextual data received, the Local Exchange will choose and establish the appropriate communication channels between User A and User B.

The feedback communication link from the actual context is to give the services information about the preferred interaction modalities, and the preferred communication media. In addition to the contextual determined interaction modalities and communication media, there is a strong focus on direct user control.

30/ Merits of the invention

Our claim is that to make useful, functional and powerful new tools for supporting human-human communication and interaction at a distance, the context has to be considered in the design of communication solutions.

5

To exemplify the merits of this invention, a couple of scenarios and examples are described below:

**Scenario 1. In an out of a vehicle context.**

10 It is night in Oslo. Peter receives some calls from USA. The communication system know that Peter is asleep, so all calling attempts are routed to the appropriate place. In the morning, Peter is at his office. The communication system notices this, and routes his calls to his office  
15 phone. After lunch, he is going to a meeting about 1-hour drive from the office. When he enters the car, the communication system notices this, and switch to hands free operation for Peter. Arriving at the meeting, the communication system notices the audio level, and in co-operation  
20 with Peter, the appropriate context is determined.

**Scenario 2. Biometrix context.**

Jon has just been operated at the hospital. The communication system is polling the biometrics data from Jon's body,  
25 and determining his physical condition. This biometrics data are sent regularly to the hospital for remote logging and control.

**Scenario 3. Time of day context.**

30 Anne is out travelling in a different time zone, and different climate than usual. The communication system determines the new relative time and climate.

**Scenario 4. Physical condition at work.**

Allan is installing new electrical equipment at construction sites. He is busy with some machinery, in a noisy environment. The communication system determines the noise, and makes the appropriate actions with both the interaction modalities and the choice of communication media for him.

## P a t e n t   c l a i m s

1. Arrangement for improving a communication system so as to further improve the support of human - human communication and interaction at a distance,  
5 c h a r a c t e r i s e d   i n   t h a t   t h e   a r r a n g e m e n t   c o m -  
p r i s e s   m e a n s   f o r   p r o v i d i n g   i n f o r m a t i o n   a b o u t   t h e   c o n t e x t   i n  
w h i c h   a   u s e r   i s   s i t u a t e d .
- 10 2. Arrangement as claimed in claim 1,  
c h a r a c t e r i s e d   i n   t h a t   s a i d   m e a n s   f o r   p r o -  
v i d i n g   c o n t e x t u a l   i n f o r m a t i o n   c o m p r i s e s   s e n s o r s   p e r m i t t i n g  
c o l l e c t i o n   o f   c o n t e x t u a l   p a r a m e t e r s .
- 15 3. Arrangement as claimed in claim 1 or 2,  
c h a r a c t e r i s e d   i n   t h a t   s a i d   c o n t e x t u a l   p a -  
r a m e t e r s   c o l l e c t i n g   m e a n s   a r e   a d a p t e d   t o   s e n d   s a i d   p a r a m e -  
t e r s   t o   a   C o n t e x t   R e g i s t e r   ( C R ) .
- 20 4. Arrangement as claimed in claim 3,  
c h a r a c t e r i s e d   i n   t h a t   s a i d   C o n t e x t   R e g i s t e r  
( C R )   c o n t a i n s   s a i d   c o n t e x t u a l   p a r a m e t e r s .
- 25 5. Arrangement as claimed in any of the preceding claims,  
c h a r a c t e r i s e d   i n   t h a t   s a i d   c o m m u n i c a t i o n  
s y s t e m   c o m p r i s e s   m e a n s   f o r   l e t t i n g   a   s e r v i c e / a p p l i c a t i o n ,  
e . g .   c a l l   r e q u e s t   f r o m   a d d r e s s i n g   u s e r   ( B )   c o m m u n i c a t e   w i t h  
s a i d   s o u r c e   o f   c o n t e x t u a l   i n f o r m a t i o n ,   i . e .   s a i d   C R ,   a s k i n g  
f o r   t h e   c o n t e x t u a l   i n f o r m a t i o n   o f   t h e   a d r e s s e e   u s e r   ( A )
- 30 6. Arrangement as claimed in claim 5,

c h a r a c t e r i s e d i n that the feedback communication link established between the user contextual information source, i.e. the Home Context Register (HCR), and the user (A, B) in question, also communicates information  
5 to the services of the communication system about any preferred interaction modality (IES), and any preferred communication media.

7. Arrangement as claimed in claim 6,  
10 c h a r a c t e r i s e d i n that said feedback communication link handling feedback contextual parameters is adapted to be influenced by direct user control, for further refined selection of contextually determined interaction modalities and communication media.

15 8. Arrangement as claimed in any of the preceding claims, c h a r a c t e r i s e d i n that said information about the user context comprises:

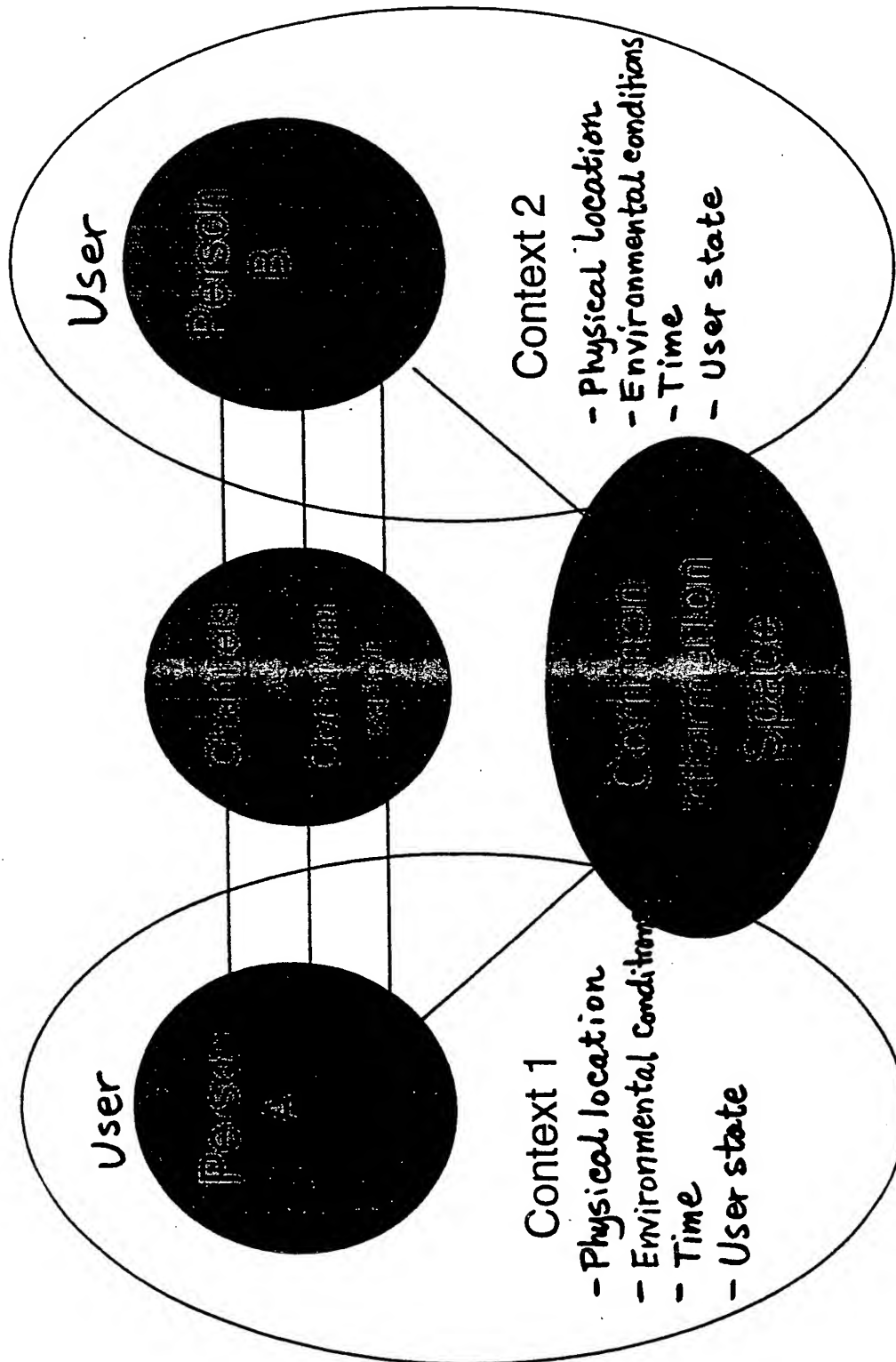
- location (physical conditions),
- 20 - time,
- mode (person and group)

9. Arrangement as claimed in any of the preceding claims, c h a r a c t e r i s e d i n that said user context information comprises inter alia the following context determining parameters:

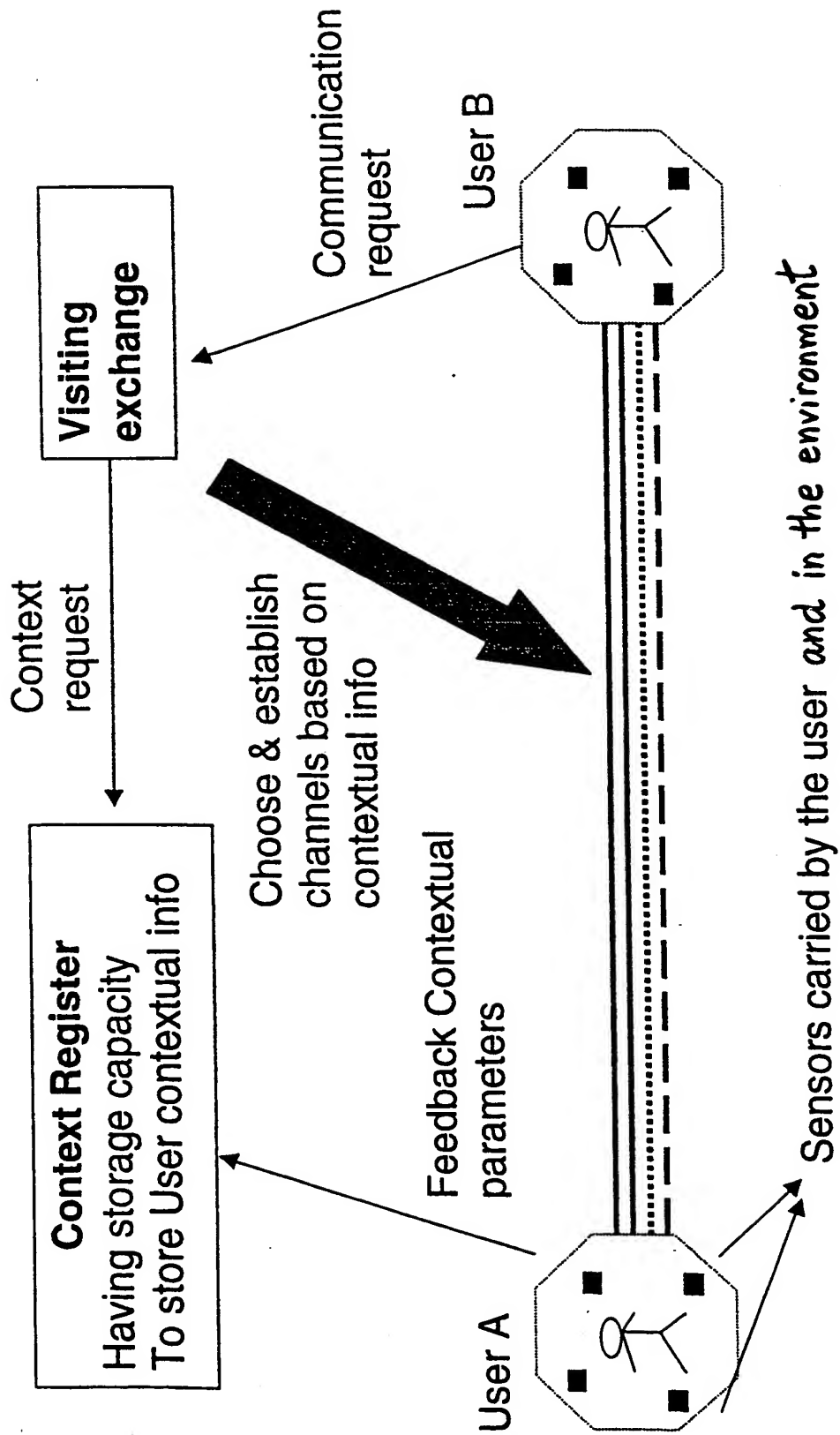
- Physical location (co-ordinates, longitude, latitude, altitude),
- Physical movement (speed, direction of movement),
- 30 - Weather conditions (temperature, humidity, rain/snow),
- Light condition (dim, sunny, etc.),

- Audio condition (silent, noisy, etc.),
- Time of day (local time, day, evening, night),
- Task at hand (attention span...),
- Mood (asleep, awake, busy, free).





**Figure 1**  
**Contextual Communication**



**Figure 2**  
**Architecture of Contextual Communications**

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/NO 99/00285

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 44 20 462 A (SEL ALCATEL AG) 14 December 1995 (1995-12-14) the whole document ---	1-6,8,9
A	WO 97 47121 A (AT & T CORP) 11 December 1997 (1997-12-11) page 9, line 7 - line 30; figures 2,4 ---	1,6,8,9
X	EP 0 700 227 A (NOKIA MOBILE PHONES LTD) 6 March 1996 (1996-03-06) the whole document ---	1,2,5-7
X	US 5 610 969 A (FARRIS ROBERT D ET AL) 11 March 1997 (1997-03-11) cited in the application column 8, line 13 -column 9, line 22 -----	1-6,8,9

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Schut, G

# INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 4420462	A	14-12-1995	AU 701203 B	21-01-1999
			AU 2791695 A	05-01-1996
			CA 2169379 A	21-12-1995
			WO 9534985 A	21-12-1995
			EP 0713626 A	29-05-1996
			JP 9502072 T	25-02-1997
WO 9747121	A	11-12-1997	US 5903845 A	11-05-1999
			BR 9702280 A	20-07-1999
			CA 2228139 A	11-12-1997
			EP 0852870 A	15-07-1998
			JP 10512433 T	24-11-1998
			NO 980460 A	03-02-1998
EP 0700227	A	06-03-1996	GB 2293294 A	20-03-1996
			JP 8084369 A	26-03-1996
US 5610969	A	11-03-1997	US 5592533 A	07-01-1997